

PATENT

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Application No. 10/821,726

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Inventors: Michael Wayne GRAHAM *et al.*

Confirmation No.: 1523

Application No.: 10/821,726

Group Art Unit: 1635

Filed: April 8, 2004

Examiner: Vivlemore, Tracy Ann

For: Synthetic Genes and Genetic Constructs Comprising Same

Commissioner for Patents
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THIRD PARTY SUBMISSION UNDER C.F.R. 1.99
IN PUBLISHED APPLICATION

Sir:

This third party submission is being made under the provisions of 37 C.F.R. 1.99 for the purpose of calling the Examiner's attention to prior art considered relevant to the above U.S. Appl. No. 10/821,726 (published as US 2004/0266005 A1 on December 30, 2004).

The patent/publications submitted for consideration are listed below:

1. US 6,506,559
2. US 6,506,559 (redacted)
3. Polyadenylation, Wikipedia, 3 pages, <http://en.wikipedia.org/wiki/Polyadenylation>
(February 20, 2007)
4. Polyadenylation, Wikipedia, 3 pages, <http://en.wikipedia.org/wiki/Polyadenylation>
(February 20, 2007) (redacted)

OK to
scan
W.R. Dixon, Jr.
3/6/07

WILLIAM R. DIXON, JR.
SPECIAL PROGRAM EXAMINER

Copies of the above listed references are attached hereto. The attachments are in the English language. Redacted versions of the references are included, as permitted according to MPEP 1134.01(II).

A copy of this submission with attachment is being served on the applicants by first class mail concurrent to this filing, at:

Patton Boggs LLP
8484 Westpark Drive, Suite 900
McLean VA, 22102

This submission is being filed after two months following the date of publication of the application. However, it is respectfully submitted that consideration of the redacted references appears to now be appropriate in light of recent prosecution and therefore the currently redacted references could not have been submitted within the two month time frame. The processing fee of \$130.00 in accordance with Rules 1.99(e) and 1.17(i) is included. In addition, the required fee (\$180.00) pursuant to Rules 1.99(b)(1) and 1.17(p) is included. Please charge the required fees totaling \$310.00 to Deposit Account No. 50-1283.

A self-addressed postcard is attached so that the receipt of this submission might be acknowledged.

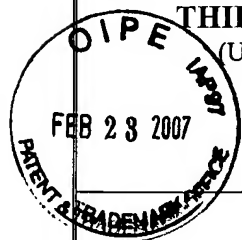
Dated: February 23, 2007

Respectfully submitted,

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**THIRD PARTY SUBMISSION**

(Use several sheets if necessary)

PTO Form 1449

Attorney Docket No.

Application No.

10/821,726

Applicants: Michael Wayne GRAHAM *et al.*

PAGE 1 of 1

Filing Date: April 8, 2004

Group Art Unit: 1635

U.S. PATENT DOCUMENTS

Initial		Document No.	Date	Name	Class	Sub-Class	Filing Date
	1.	US 6,506,559	01/14/2003	Fire <i>et al.</i>			
	2.	US 6,506,559 (redacted version)	01/14/2003	Fire <i>et al.</i>			

FOREIGN PATENT DOCUMENTS

		Document No.	Date	Country	Class	Sub-Class	Translation

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, etc.)

	3.	Polyadenylation, Wikipedia, 3 pages, http://en.wikipedia.org/wiki/Polyadenylation (February 20, 2007)
	4.	Polyadenylation, Wikipedia, 3 pages, http://en.wikipedia.org/wiki/Polyadenylation (February 20, 2007) (redacted) ~

Examiner

Date Considered

Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Polyadenylation

From Wikipedia, the free encyclopedia

Polyadenylation is the covalent linkage of a poly(A) tail to a messenger RNA (mRNA) molecule. It is part of the route to producing mature messenger RNA for translation, in the larger process of protein synthesis to produce proteins. In eukaryotic organisms, most messenger RNA molecules end with a poly-A stretch at their 3' ends. The polyadenosine (poly-A) tail protects the mRNA molecule from exonucleases and is important for transcription termination, for export of the mRNA from the nucleus, and for translation. Some prokaryotic mRNAs also are polyadenylated, although the polyadenosine tail's function is different from that in eukaryotes.

Polyadenylation occurs after transcription of DNA into RNA in the nucleus. After the polyadenylation signal has been transcribed, the mRNA chain is cleaved through the action of an endonuclease complex associated with RNA polymerase. The cleavage site is characterized by the presence of the base sequence AAUAAA near the cleavage site. After the mRNA has been cleaved, 50 to 250 adenosine residues are added to the free 3' end at the cleavage site. This reaction is catalyzed by polyadenylate polymerase.

Polyadenylation process

1. Cleavage and Polyadenylation
Specificity Factor (CPSF) and Cleavage Stimulation Factor (CstF), both of which are multi-protein complexes, start bound to the rear of the advancing RNA polymerase II.
2. As the RNA polymerase II advances over the adenylation signal sequences CPSF and CstF transfer to the new pre-mRNA, CPSF binding to the AAUAAA sequence, and CstF to the GU or U rich sequence following it.
3. CPSF and CstF promote cleavage approximately 35 nucleotides after the end of the AAUAAA sequence. Immediately Polyadenylate Polymerase (PAP) starts writing the polyadenosine tail. Cleavage will not occur unless PAP is bound to the complex, eliminating the possibility of premature cleavage. Nuclear Polyadenylate Binding Protein (PABPN1) immediately binds to the new polyadenosine sequence.
4. CPSF dissociates, and polyadenylation by PAP continues to write an adenosine tail of approximately 50 to 250 nucleotides, depending on the organism. PABPN1 acts as some kind of molecular ruler, specifying when polyadenylation should stop.
5. PAP dissociates, and PABPN1 remains bound. It is thought this, along with the 5' cap, helps target the mRNA for nuclear export.

Polyadenylation is initially dependent on CPSF and the AAUAAA sequence (for the first 10 As or so), after which polyadenylation is simply dependent on the existing poly A tail.

References

- Bruce Alberts et al, (February 28, 2002). *Molecular Biology of the Cell* (fourth edition. ISBN 0-8153-3218-1).

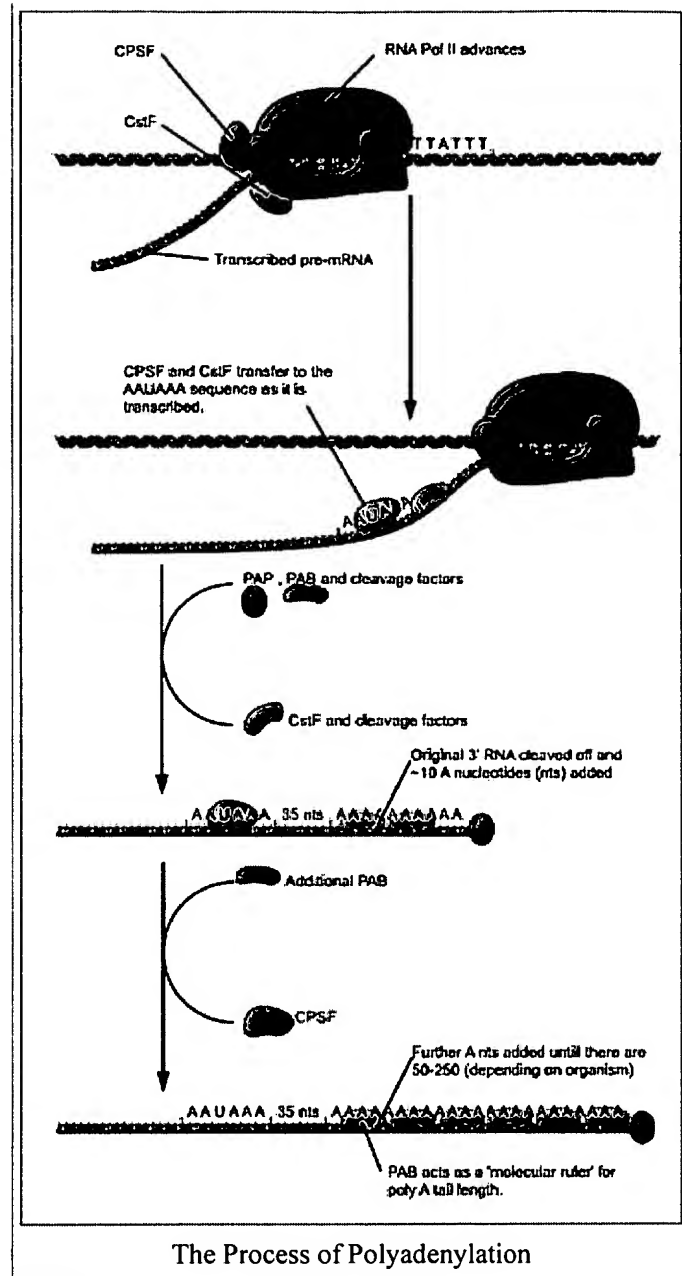
See also

Related proteins and complexes:

- RNA polymerase
- RNA polymerase II

Related compounds:

- Adenosine
- three prime untranslated region



Post transcriptional modification

[hide]

Transcription - RNA splicing (Precursor mRNA, Intron/Exon, snRNP, Spliceosome, Alternative splicing) -
Polyadenylation - 5' cap

Retrieved from "<http://en.wikipedia.org/wiki/Polyadenylation>"

Categories: Gene expression | RNA | Cell biology stubs

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is important for transcription termination.

